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THE SIGNIFICANCE OF A SOUND PHYSIQUE

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Juvenal's dictum of "a sound mind in a sound body" is a brief description of a happy state in this world, but how few of us realize its practical significance. Our bodies as they exist to-day are the results of struggles and conflicts that have gone on through the ages, in which the ability to stand erect and to use the trunk and limbs in lifting, carrying, pushing, pulling, striking, walking, running, jumping, swimming, etc., have played a most important part in enabling man to maintain a footing in the world and to compete for existence with other species of the animal kingdom. Yet there is hardly one of these physical activities in which man has not been surpassed by some of the lower animals. Therefore if we would account for man's supremacy among animated creatures we must look for it in the superior development of his brain and the more intelligent use of his hands and fingers.

This fact has become so evident during the past few centuries that nearly all the schools and colleges founded for the education of the young have given much attention to the training of the mind and paid little attention to the training of the body. It is only within a very few years that technical schools for training in the manual arts have come into existence, and there is no school or college that I know of where the education of the body as such is made an essential part of the curriculum. To sustain this theory as to the superiority of the mind over the body the young are frequently told of the great work that has been done by Pascal, Darwin, Spencer, Marcus Aurelius, William Wilberforce, Robert Louis Stevenson and others, though they all had inferior physiques, as contrasted with the mental and moral efforts of the world's champion oarsmen, matadors, pugilists and athletes with their splendid bodies.

These exceptional cases only serve to illustrate the extent to which nature will go in her variations from the normal when special development for any purpose is required. Danger lies in the

direction of the extremes, and unsoundness, disease and extermination are the inevitable results of too great a departure from the mean. In mental and physical development nature always tends toward the normal. In refusing to perpetuate the extremes she keeps down the number of freaks and anomalies. In seeking for man's success in competing with rivals and contending with the forces of nature we have not been sufficiently mindful of what he owes to the division of labor and the ability to coöperate with others. This is now becoming very apparent in the building of a community or nation—it is equally apparent in the building of a sound physique.

One of the first difficulties encountered in trying to develop the muscles of any particular part of the body is that a limit in size and power in these muscles is soon reached. If these muscles are on the calf of the leg, for instance, and one is desirous of making them larger and stronger, it is often found necessary to develop the muscles in other parts of the body before the calf muscles will increase beyond their first limitation. Finally a stage of development is soon reached in each individual beyond which no amount of further use or practice will carry it. This was for some time a paradox—now the same law is known to apply to all the other organs and tissues of the body. Larger muscles in a limb would not only call for larger bones, tendons and connective tissues, but for larger blood vessels, a better developed heart, lungs, nervous system, etc.

The interdependence of one part of the body upon another has been brought about largely through a differentiation of the tissues and organs. In the lowest forms of animal life, as in the amoeba, for instance, the little animal feels, moves, breathes, catches and digests food, although it consists of but one cell. The higher animals perform their functions by means of different cells set apart in special organs. Thus we have bony tissue, cartilaginous tissue, muscular tissue, respiratory tissue, nerve tissue, etc., each having special duties to perform. The physiological division of labor among the higher animals has resulted in the better performance of the specific functions of the various organs and tissues of the body, and consequently in the development of the highest species as represented by man. The development of the higher animals has been greatly favored by the establishment of the heart, lungs, blood

vessels and nervous system, by which the food and oxygen of the air is carried to all parts of the body and the exchange between the different tissues is regulated and controlled.

The high physiological position attained by man has not been won without a great internal struggle. We are all familiar with the external struggle for existence—but how many of us have thought that the primary and fundamental struggle must be that of the organic forces at work in creating a structure capable of pushing its way amid external forces?

The organism must find a footing in the world before it can compete with rivals and defend itself against foes. The reason why fifty per cent. of the children born fail to find a footing in the world is in consequence of inherited weakness, internal dissensions or imperfect development, all of which may be traced to malnutrition. All parts of the body are competing for their pabulum or food which is supplied by the blood. The parts which are most active generally get the larger share, but as the quantity of blood in the body is limited some other parts get less than their share. This leads to the establishment of an organic weakness or constitutional defect. If one of the parts deprived of its proper nutriment is an important organ, then imperfect function will result and all parts of the body will suffer in consequence. Sometimes an excessive accumulation of muscle tissue impairs the efficiency of the muscles, the person becoming muscle bound, as it is termed. Whenever there is an encroachment of one tissue upon another there is always a disturbance of the normal balance, which readily passes into a pathological state. Fatty degeneration of the heart or some other diseased condition results.

A sound physique, therefore, implies a bodily condition in which there are not only well-proportioned limbs, perfection of structure and harmony in muscular development—but a condition in which harmony and accord exist throughout the whole organism. If these facts are well founded then the health and soundness of the various tissues and organs of the body must depend upon their receiving a just share of the body's nutriment. The distribution of nutriment we found to be greatly influenced by the activity of the different organs and tissues. We have seen that man's status as an animal among animals was the resultant of an all-round conflict with nature and brute forces which must have given him the vigor-

ous all-round physical development with which he is naturally endowed. We have also seen that his recent progress as a social being has been greatly dependent upon the division of labor and the further culture of his fingers, hands and brain. But the division of labor through the invention of machinery calls for the use of very few muscles and faculties, and many occupations do not furnish enough all-round employment for the body to keep it in good health.

Think of the simplicity of service now expected of many of the employees in our great railroad systems. One man sells a ticket, another watches it drop in a box, another rings a bell or blows a whistle, another presses a button, another opens or closes a gate, and so on. This is fairly typical of the little physical and mental effort now required to earn a livelihood in many of our great industries. It is hardly necessary to add that such a pursuit carried on persistently through a long term of years without any other life interest to supplement it would lead to general atrophy of the muscular and nervous systems. In other words, a larger portion of the working classes, though toiling for wages and food externally, are literally starving some of their bodily tissues, if not their very souls, for want of sufficient nutriment. For it matters very little how much food is consumed or how much air breathed, the tissues can only be well fed just so far as they can be induced to take up this food and air as a result of their organic activity.

As division of labor and use of machinery have greatly reduced the amount of all-round physical and mental effort now required of the individual, as well as the hours of his employment, it becomes a matter of vital necessity that something should be done to make up for the deficiency of his occupation as a health promoting, body building and mind developing agency. The leisure now gained through the great reduction in the hours of labor affords an admirable opportunity for physical and mental culture and recreation and for all-round personal improvement. To embrace this opportunity is the only way to counteract the narrowing and deadening influence of our highly specialized occupations, and to keep up the mental and physical vigor of the race. But our schools, colleges and athletic clubs all tend to specialize, and with the increasing demand for more industrial training less and less time and

attention are being given to mental and physical culture as such. If extent of knowledge, the advancement of science, skill in labor, excellence in art and preëminence in sport are all thought worthy of the greatest effort on the part of the individual, it is difficult to see how a high degree of specialization is to be prevented.

This concentration of effort and singleness of pursuit frequently bring success—but it is success dearly purchased by many brain workers, by emaciated limbs, feeble digestion, weak lungs, congested liver or exhausted nervous system. In spite of the fact that there are a few exceptional men who have won great distinction though handicapped by a diseased organism and a feeble body, I am prepared to maintain that the world's work has not been done by invalids, but by men of a vigorous constitution and a sound physique. This applies to those who have worked with their brains as well as to those who have worked with their muscles. This must necessarily be so, since the brain, being an organ of power, depends upon the fuel received as food through the circulation of the blood. Thus the lungs and heart are immediately involved. These organs again fall back upon the digestive apparatus and this apparatus upon the tone of the muscular system, which if feeble may impair the capacity of a good heart, sound lungs and a well-constituted brain.

The capacity of the brain for work, then, may be said to depend upon the soundness of the physique. By a sound physique I do not mean the supreme development of the muscular system as frequently represented by heavyweight athletes and professional strong men. I mean the natural physique as found in the youth of both sexes ranging from ten to seventeen years of age. The observations made upon some thirty thousand school children in St. Louis, Mo., in 1893 established the fact that children of the same age of superior physique, as shown by their superior height and weight, were also superior in their mental capacity as shown by the school records. This fact has been confirmed by more recent examination of several hundred thousand children made by different observers at Chicago, Ill.; Cambridge, Mass.; Omaha, Neb.; London, England; Berlin, Germany, and St. Petersburg, Russia. The same observation of a superior physique accompanying superior mental faculties was shown in the members of the Royal Society of England.

I should like to believe that it would be true of any distinguished body of intellectual workers in this country. Considering the large per cent. of professional men who were rejected as unfit for service during the Civil War, I fear that this assumption might not be verified. I regret to add, also, that this fact is not borne out by any correspondence between the physical measurements and the rank-book tests of our college students. The athletic students, however, devote much of their time and energy to the development of their physique, while the scholarship men devote themselves almost exclusively to mental work.

Is it not a sad commentary on our system of higher education that the natural condition of a superior brain in a superior body, that undoubtedly exists in our youth during their early teens, the formative period of their lives, should not be carried through their maturity to manhood. Perhaps it is, and the man with the superior physique will be heard from later in life. If so the rank-book of the instructor records the faithfulness and industry of the scholarship man rather than his superior brain power. To this industry should be coupled his willingness to sacrifice his bodily soundness or health in hopes of gaining greater mental power and efficiency. This is a futile assumption, as we have already shown. So futile, that in the treatment of criminals, dullards and the mentally defective, who have as a class very poor physiques, it has been found necessary to reconstruct and improve them physically as far as possible by systematic exercise, bathing, dieting, etc., before they can be much improved mentally and morally. With this method of procedure most remarkable results have been accomplished. Are not our school children and college youth worthy of as rational treatment as is bestowed upon criminals, dullards and defectives? Some of us think so and have been advocating for years the training of the muscles, the cultivation of the senses and the improvement of the physique as a fundamental basis for a broader, sounder and higher mental development.

All of the great nations that have ever done superior intellectual work have preceded this mental awakening with a period of great physical activity and bodily improvement. We are already beginning to record a very considerable increase in the average measurements of many of our school and college youth. In 1880 the average height of the students at Harvard University, including

all classes, was 67.7 inches and the average weight was 135.2 pounds, both measurements being taken without clothes. In 1906 the same class of students at Harvard averaged 68.7 in height and from 140 to 143.3 pounds in weight—the scientific students weighing about 3.3 pounds on the average more than the academic classes. In 1880 only 50 per cent. of the Harvard students would have surpassed the height and weight of the army average. To-day over 65 per cent. would pass this standard. This is a most remarkable uplift in growth and development for any considerable body of men in any country or community to have attained in twenty-five years, and is a great tribute to the noble efforts that have been made during the past quarter century to interest our school and college youth in athletic sports, plays, games and gymnasium exercises.

I am optimistic enough to believe that when the adoption of regular systematic physical activity for our youth of both sexes becomes more universal a gradual improvement in physique will be accompanied by an improvement in mental and moral attainments. To hasten this day the whole boy must be put to school, and the school and college must assume the responsibility for his mental, moral and physical development. When this time arrives the community will not be slow to realize the true significance of a sound physique.